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(54) IMPROVED BUILDING STRUCTURE

(71) We, AB LIMSTRA, a Swedish Joint-Stock Company, of Hisings Kärra, Sweden, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an improved building structure composed of panels joined at their edges by first tongue and groove connections having elements located in the plane of the building structure as well as by second tongue and groove connections having elements located perpendicular to said plane.

The mounting and interconnection of fabricated panel elements implies certain difficulties and an object of this invention is to provide a self locking device by means of which the building panels may be interlocked in a simple and efficient manner: characterised in that the two tongue and groove connections are designed to permit a second panel to be swung into the plane of the building structure after being brought into contact with elements of the connections at a first panel already fitted in the plane of the structure, and further in a third member locked in the joint between the two panels and extending outside the same substantially at right angles to the panels.

The accompanying drawings show, by way of example only, several embodiments of the invention, in which:

Figure 1 shows in section a partition wall composed of two parallel sets of panels;

Figure 2 shows a section through a modified design of a double skin wall where metal members are utilized to form the tongues of the second connection;

Figure 3 shows a front view of an alternative arrangement of the metal member utilized in Figure 2; while

Figure 4 shows a modified design of a metal member utilized to form the second tongue connection.

Figure 1 shows a wall composed of panels arranged spaced apart and parallel to each

other and connected according to the invention. The panels are alternatively marked 1 and 2 respectively. One is provided at least at one edge with a tongue 3, and the other panel 2 is provided with a corresponding groove 4. This tongue and groove connection thus is arranged in the plane of the wall. The panels 1 and 2 have interengaging parallel surfaces 1 parallel to the plane of the wall at half the thickness of the panels. A groove 7 is arranged in a backing member 10 fitted at the joint and opposite to a groove 8 in the adjacent panel 1 or 2, respectively these grooves 7 and 8 thus are arranged perpendicularly to the plane of the wall and are arranged to receive a common tongue 9. This tongue may consist of a strip of fibre board and is suitably connected to one of the grooves 7 or 8, for instance by glueing. In order that a sufficient support for the two panels in relation to each other be obtained it is essential that the distance between the tongue and groove of the second connection and the first mentioned connection 3, 4 be greater than the depth of the tongue 3. These two tongue and groove connections are designed to permit a second panel to be swung into the plane of the building structure.

The panels 1 and 2 are comparatively thin and the joint is strengthened by the backing member 10 provided on the inside of the panels. The interconnection of the spaced panels is made by means of cross pieces 24, which are interlockingly connected to the panels, each cross piece forms together with a backing members 10 fitted at each edge thereof a third member, which is locked in the joins between the two panels and extends away from the same substantially at right angles to the panels. For this purpose each panel 1 and 2 is provided with a longitudinal groove 25, in its inner plane side, said groove being adapted to receive a correspondingly formed tongue 26 on the adjacent edge of the cross piece 24. Parallel to but spaced from and perpendicular to each

tongue 26 is a further groove 27, co-operating with a tongue 28, being part of an edge or heel on the pertaining backing member 10.

- 5 The mounting of a partition of this type is performed as follows:—

A panel 2 is for instance by means of a locking board 30, secured to a connecting piece 29 that has the same width as the desired distance between the panels. A cross piece 24 is then mounted by introducing the tongue 26 in groove 25. A panel 1 is thereafter arranged in an interlocking grip, which occurs when tongue 3 of panel 2 is inserted in groove 4 of element 1. A backing member 10 is then fitted by inserting tongue 28 into groove 27 and tongue 9 into grooves 7 and 8. This procedure is repeated until the one side face of the partition with the necessary cross pieces has been erected. All electrical conducts may now be mounted inside the partition wall, as well as possible insulating material. The panels of the opposite face of the partition side is then brought to interlocking grip with the cross pieces 24, step by step as has been described for the first half partition.

Figure 2 shows the joint between the two skins of a double wall of modified design. The individual skins are basically of the same design as that in Figure 1 and the same reference numerals are used. The tongue 9 of the second connection is however, here obtained by turning parts of the flanges of a U-shaped metal member alternatively in opposite directions. Each shank of the member will thus have a partial cross bar at its end, which will fit into the juxtaposed grooves 7 and 8 respectively. The metal member 31 forms part of the wall construction and serves to keep the skins in proper position. An alternative arrangement of the metal member is shown in Figure 3.

Figure 4 shows a further manner of utilizing the edge portion of a metal member for forming the tongue of the second connection. The member 32 in this case has essentially channel form, and one flange thereof is provided with parts alternatively turned 90° in relation to the plane of the flange to form the tongue 9. The other flange 33 is turned twice inwards through 90° to rest against the outer surface of the wall panel 2. Member 32 may be utilized for supporting various kinds of elements connected to the wall—for instance a further wall connected at right

angles thereto—but it may with higher walls just form a strengthening of the structure.

If the building elements 1 and 2 are to be used as partition walls between rooms, said elements are preferably formed with the same height as the height of the room, and one longitudinal side on each element is provided with a groove and the other longitudinal side with a tongue according to the invention. Panels adapted as floor—or roofboards are suitably formed along two bordering sides with grooves, and along the two remaining sides with tongues. The tongues 9, 17, 22, 28 and the co-operating grooves 7, 8, 18, 27 may have the same length as the panels or may be shorter. The material in the edge portions of the panels may be synthetic resin or a suitable metal, for instance aluminium.

WHAT WE CLAIM IS:—

1. A building structure composed of panels, joined at their edges by first tongue and groove connection having elements located in the plane of the building structure, as well as by second tongue and groove connection having elements located perpendicular to said plane, characterised in that the two tongue and groove connections are designed to permit a second panel to be swung into the plane of the building structure after being brought into contact with elements of the connections at a first panel already fitted in the plane of the structure, and further in a third member locked in the joint between the two panels and extending outside the same substantially at right angles to the panels.

2. A building structure as claimed in claim 1 in which the third member is a T-shaped edge portion which forms the tongue of the second connection.

3. A building structure as claimed in claim 2 comprising two sets of parallel panels spaced apart from one another, in which the third member is a shallow U-shaped element, the edges of the limbs of which are T-shaped to form the tongues of the second connection in both sets of panels.

4. A building structure composed of panels as claimed in Claim 1 substantially as hereinbefore described with reference to Figures 1—3 of the accompanying drawings.

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FIG. 1.



